

**Patent Claims**

1. Polypeptide having the biological activity of a helicokinin receptor and comprising an amino acid sequence which has at least 70% identity with the sequence of SEQ ID NO: 2
2. Polypeptide according to Claim 1, characterized in that the amino acid sequence corresponds to the sequence of SEQ ID NO: 2.
3. Polynucleotide comprising a nucleotide sequence which encodes a polypeptide according to Claim 1.
4. Polynucleotide according to Claim 3, characterized in that it is a single-stranded or double-stranded DNA or RNA.
5. Polynucleotide according to Claim 4, characterized in that it is a fragment of genomic DNA or cDNA.
6. Polynucleotide according to Claim 3, characterized in that the nucleotide sequence corresponds to the sequence of SEQ ID NO: 1.
7. Polynucleotide according to Claim 3, characterized in that it hybridizes under stringent conditions to the sequence of SEQ ID NO: 1.
8. DNA construct comprising a polynucleotide according to any of Claims 3 to 7 and a heterologous promoter.
9. Vector comprising a polynucleotide according to any of Claims 3 to 7 or a DNA construct according to Claim 8.

10. Vector according to Claim 9, characterized in that the polynucleotide is linked functionally to regulatory sequences which ensure the expression of the polynucleotide in pro- or eukaryotic cells.
- 5 11. Host cell containing a polynucleotide according to any of Claims 3 to 7, a DNA construct according to Claim 8 or a vector according to Claim 9 or 10.
12. Host cell according to Claim 11, characterized in that it is a prokaryotic cell, in particular *E. coli*.
- 10 13. Host cell according to Claim 11, characterized in that it is a eukaryotic cell, in particular a mammalian or insect cell.
14. Antibody which binds specifically to a polypeptide according to Claim 1.
- 15 15. Transgenic invertebrate containing a polynucleotide according to any of Claim 3 to 7.
16. Transgenic invertebrate according to Claim 15, characterized in that it is *Drosophila melanogaster* or *Caenorhabditis elegans*.
- 20 17. Transgenic progeny of an invertebrate according to Claim 15 or 16.
18. Method of preparing a polypeptide according to Claim 1, comprising
- 25 (a) culturing a host cell according to any of Claims 11 to 13 under conditions which ensure the expression of the polynucleotide according to any of Claims 3 to 7, or
- 30 (b) expressing a polynucleotide according to any of Claims 3 to 7 in an in vitro system,

- (c) obtaining the polypeptide from the cell, the culture medium or the in vitro system.
- 5      19. Method of preparing a polynucleotide according to any of Claims 3 to 7, comprising the following steps:
- (a) Full chemical synthesis in a manner known per se, or
  - 10      (b) chemical synthesis of oligonucleotides, labelling of the oligonucleotide, hybridizing the oligonucleotides to DNA of a genomic library or cDNA library generated from insect genomic DNA or insect mRNA, respectively, selecting positive clones and isolating the hybridizing DNA from positive clones, or
  - 15      (c) chemical synthesis of oligonucleotides and amplification of the target DNA by means of PCR.
- 20      20. Method of generating a transgenic invertebrate according to Claim 15 or 16, which comprises introducing a polynucleotide according to any of Claims 3 to 7 or a vector according to Claim 9 or 10.
- 25      21. Method of finding novel active compounds for crop protection, in particular compounds which alter the properties of polypeptides according to Claim 1, comprising the following steps:
- (a) Providing a host cell according to any of Claims 11 to 13,
  - 30      (b) culturing the host cell in the presence of a chemical compound or a sample which comprises a multitude of chemical compounds,

(c) detecting altered properties.

22. Method of finding a chemical compound which binds to a polypeptide according to Claim 1, comprising the following steps:

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(a) Bringing a polypeptide according to Claim 1 or a host cell according to any of Claims 11 to 13 into contact with a chemical compound or a mixture of chemical compounds under conditions which permit the interaction of a chemical compound with the polypeptide, and

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(b) determining the chemical compound which binds specifically to the polypeptide.

23. Method of finding a chemical compound which alters the expression of a polypeptide according to Claim 1, comprising the following steps:

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(a) Bringing a host cell according to any of Claims 11 to 13 or a transgenic invertebrate according to Claim 15 or 16 into contact with a chemical compound or a mixture of chemical compounds,

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(b) determining the concentration of the polypeptide according to Claim 1, and

(c) determining the chemical compound which specifically affects the expression of the polypeptide.

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24. Use of a polypeptide according to Claim 1, of a polynucleotide according to any of Claims 3 to 7, of a vector according to Claim 9 or 10, of a host cell according to any of Claims 11 to 13, of an antibody according to Claim 14, or of a transgenic invertebrate according to Claim 15 or 16 for finding novel active compounds for crop protection or finding genes which encode

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polypeptides which participate in the synthesis of functionally similar helicokinin receptors in insects.

25. Use of a modulator of a polypeptide according to Claim 1 as insecticide.